Massachusetts Division of
Health Care Finance and Policy

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Commissioner

ANALYSIS IN BRIEF

Premium Increases Affect Health Insurance Coverage

The affordability of health insurance is the most important factor affecting the rate of insurance coverage. A national report in 1998[1] found that growth in the employee share of premium expenses accounted for three-quarters of insurance coverage loss nationwide between 1989 and 1996. The report estimated that a one percent increase in the employee share of the premium was associated with a 0.203 percent reduction in overall coverage for workers. This is also referred to as a price or premium elasticity of -0.203. Based on this estimation, a 10% increase in the employee share of the premium will cause a 2% reduction in insurance coverage assuming all other relevant factors are unchanged.

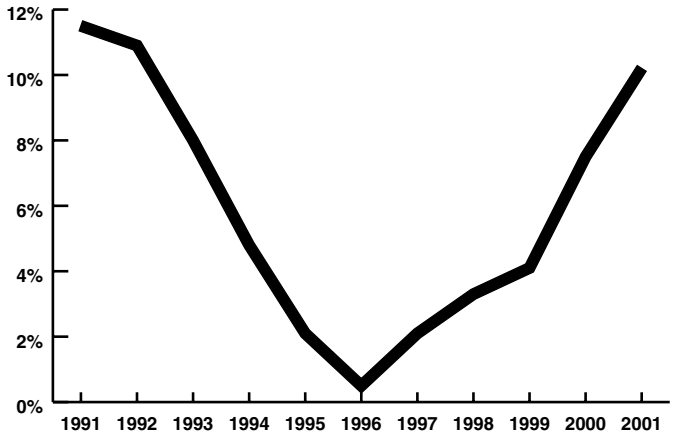
Premium Elasticity

Premium elasticity measures the impact of changes in health insurance premiums on the rate of health insurance coverage. Since it is unknown whether a national estimate of premium elasticity is applicable to Massachusetts, this issue of *Analysis in Brief* describes the methodology developed by the Division of Health Care Finance and Policy (DHCFP) to predict premium elasticity using Massachusetts data.

In the middle 1990s, Massachusetts initiated a series of health care reforms to expand and improve access to health insurance coverage for low-income uninsured and underinsured residents. Because of these reforms and a strong economy, Massachusetts has enjoyed a substantial drop in its uninsured rate. However, after a period of low inflation in insurance premiums during the middle 1990s, the annual rate of increase has reached double digits (see Figure 1), a trend that is expected to continue in the coming years.[2]

The sharp increase in insurance premiums will adversely affect the rate of insurance coverage, particularly for the low-income population who is more likely to be unable to afford premium increases. Dramatic premium increases may also disproportionately affect those working for smaller employers, since these employers are more likely to receive higher than average premium increases and to pass on those increases to their employees. Therefore, understanding the relationship between the cost of health insurance and the rate of health insurance coverage has become increasingly important.

Figure 1: Annual Increase in Employer-Based Insurance[3] Premiums–Firms with 200 or More Workers (1991-2001)



Source: Center for Studying Health System Change

Insurance Survey

The DHCFP conducts a survey every other year on the health insurance status of Massachusetts

Number 3
November 2001

residents.[4] The analysis presented in this issue of *Analysis in Brief* is based on data from the first two surveys (1998 and 2000). The survey sample was limited to individuals ages 18 to 64 who were employed at the time of survey—4,077 from the 1998 survey and 3,212 from the 2000 survey—for a total sample size of 7,289. Samples from the two years were combined for this analysis, since the relationship between the variables of interest was constant for both years.

Figure 2: Basic Information on Study Population

Variable	Value		Missing
Age	38.9	(mean age)	0%
Gender	48% 52%	(male) (female)	0%
Marriage Status	57% 24% 13%	(married) (single) (other)	6%
Household Size	3.2	(mean size)	0%
Income	26% 49%	(below 400% FPL) (above 400% FPL)	25%
Full-Time/Part-Time	56% 30%	(full-time) (part-time)	14%
Self-Employed	19% 60%	(self-employed) (not self-employed)	21%
Firm Size	30% 6% 12% 16%	(less than 10 employees) (10-24 employees) (25-99 employees) (100 employees and above)	36%
Employee Premium Expense	$1,591 $1,068	(mean) (median)	71%
Insurance Status	91.1% 8.9%	(insured) (uninsured)	0%

Total Sample Size = 7,289 employees

Figure 2 provides basic information about the study sample, including both demographic information and economic information.

Estimating Insurance Premiums

Among the 7,289 individuals in the study sample, only 2,125 provided premium information. The high level of missing data suggests that it is difficult for employees to remember their share of premium expenses, possibly because these expenses are typically deducted from their paycheck before they receive it. In order to estimate the impact of premium changes on the rate of insurance coverage, premium information is needed for those who currently have coverage and also for those who have been offered coverage, but elected not to take it.

A regression model was used to estimate employee premium expenses. Four factors in the health insurance survey were found to have a statistically significant impact on the employee share of premium expense. These factors included three work related variables (self-employed or not, part-time/full-time status, and firm size) and marital status, a surrogate to measure whether coverage is more likely to be individual or family. In this regression model, these four factors explain 23% of premium variation among surveyed individuals.

Premiums for 4,592 individuals with complete employment and marital information were derived using this model. To ensure the statistical reliability of these derived premiums, the reported annual premium expense in the survey was used for comparison. This premium comparison is also broken down by marital status, to separate the single premium from the more expensive family premium. Figure 3 shows that all estimated premium values fall within a 95% confidence interval of the actual reported premiums. These results indicate a statistically reliable projection

Figure 3: Comparisons between Reported and Estimated Insurance Premiums

Marital Status	Reported Average Premium	95% Confidence Interval		Estimated Average Premium
Married	$1,905	$1,807	$2,002	$1,917
Single	$1,272	$1,133	$1,411	$1,312
Other	$1,020	$920	$1,119	$1,076
Average	$1,591	$1,522	$1,661	$1,620

N = 2,125 employees who provided premium information in the surveys

derived from the regression model. Finally, the estimated premium information for all employees was used in the study sample. This approach significantly increased the sample size available for analysis.

Estimating Premium Elasticity

Combining the derived premiums with other information allowed the DHCFP to estimate the impact of these variables on the presence or absence of health insurance for the employed population. Insurance status is estimated based on employee characteristics (gender, age, income, and household size) and market price (i.e. estimated premiums). The income variable is specified as whether a respondent's income is above 400% of the federal poverty level (FPL) or below. A logistic regression model is used here since the dependent variable is a dichotomous variable (i.e. presence or absence of health insurance). The detailed regression results are presented in Figure 4.

Figure 4: Regression Results for Estimating Status of Insurance Coverage

Variable	Coefficient	Standard Error	Z	P > | z |
Constant	0.324	0.35	0.92	0.359
Estimated Premium	-0.001	0.00	-11.79	0.000
Age	0.092	0.01	11.69	0.000
Household Size	0.402	0.06	6.50	0.000
Gender	0.695	0.15	4.68	0.000
Income (< 400% FPL)	-1.200	0.15	-8.11	0.000

The dependent variable is the presence or absence of health insurance. N = 3,563.

As expected, a higher premium level lowers the probability of insurance coverage. In addition, employees whose household income is below 400% of the FPL have a lower probability of having health insurance than employees with higher household income. The probability of insurance coverage is also positively associated with age, gender, and household size.

By increasing premium inputs at fixed percentage levels with all other predictor variables held constant, the premium elasticity was found to be -0.212. This means that for every 1% increase in premium, it is projected from the model that there will be a 0.212% decrease in the proportion of people with health insurance coverage among the employed population.

Policy Implications

With the information collected in two Massachusetts health insurance surveys, the DHCFP assessed the impact of increases in the employee share of premium costs on employment-based insurance coverage. This Massachusetts specific premium elasticity is very close to the national estimate previously reported, despite the fact that Massachusetts employers provide better subsidies than employers elsewhere.[5]

By the end of 2000, Massachusetts had 3,357,300 individuals working in non-agriculture sectors.[6] Based on the survey data indicating that 91.3% of working adults have health insurance coverage, it is estimated that there were 3,065,215 employees with insurance coverage. If the employee share of premium costs increases by 10%, 65,000 Massachusetts employees would become uninsured. This is equivalent to adding 2% of Massachusetts employees (or about 1% of the state's total population) to the uninsured population. If one also considers the dependent families of these workers, the impact would be even greater.

There are a number of limitations in using data like these to estimate future changes in the rate of health insurance coverage. Behavior cannot be predicted perfectly. For instance, although health insurance premium costs are increasing at a rate of at least 10% annually, we do not know how employers will respond to these increases. Over the past few years, many employers have not passed on these increases to their employees. With a weakening economy, however, they may choose to do so, or they may choose to redefine benefit packages or to increase other employee costs such as copayments and deductibles.

These results highlight the potentially adverse impact of rapidly rising premium costs on insurance coverage in Massachusetts. Since Massachusetts has a fairly low uninsured rate (5.9% in 2000) compared to other states, even an

increase of one percentage point in this rate (to 6.9%) represents a significant increase (17%) in the population of uninsured. Considering the potential impact of slow economic growth, rising unemployment rates and decreasing income, the effect of such premium increases on insurance coverage could be even more significant. The Massachusetts specific premium elasticity estimated in this analysis provides policy makers with a useful tool to predict and prepare for the potentially adverse impact of premium inflation on the uninsured population.

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3. Center for Studying Health System Change, "Tracking Health Care Costs: Hospital Care Key Cost Driver in 2000," Data Bulletin Number 21, Revised, September 2001.
4. Massachusetts Division of Health Care Finance and Policy, *Health Insurance Status of Massachusetts Residents*, October 1998; *Health Insurance Status of Massachusetts Residents*, Second Edition, December 2000.
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6. Massachusetts Division of Employment and Training, "Massachusetts Nonagriculture Wage & Salary Employment, Seasonally Adjusted by Industry, 2000." See www.detma.org/lmi/ces-790/790_sa2000.htm.

Analysis in Brief

Analysis in Brief reflects the goal of the Division of Health Care Finance and Policy to monitor changes in the health care marketplace through useful and timely analyses of health care data. Several times a year, this publication reports on our analyses of health care costs, quality and access.

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